What are Hazardous Air Pollutants?

- Hazardous Air Pollutants (HAPs, aka Air Toxics) are those pollutants that cause or may cause cancer or other serious human health effects or adverse environmental and ecological effects
- EPA is required to control 188 HAPs

Examples of HAPs

- Benzene, which is found in gasoline
- Perchloroethylene, which is emitted from some dry cleaning facilities
- Methylene chloride, which is used as a solvent and paint stripper by a number of industries
- Mercury, which is emitted from coal-burning power plants

List of all 188 HAPs

- www.epa.gov/ttn/atw/pollsour.html
  - Click on "188 hazardous air pollutants"

Priority HAPs

- In 1999 EPA identified 25 HAPs as “drivers”, which are considered to pose greatest risk to human health and environment
- Drivers include benzene, perchloroethylene, carbon tetrachloride, acrolein, chromium 6, arsenic compounds, coke oven emissions, diesel PM, etc.

Information about HAPs

- www.epa.gov/ttn/atw/allabout.html

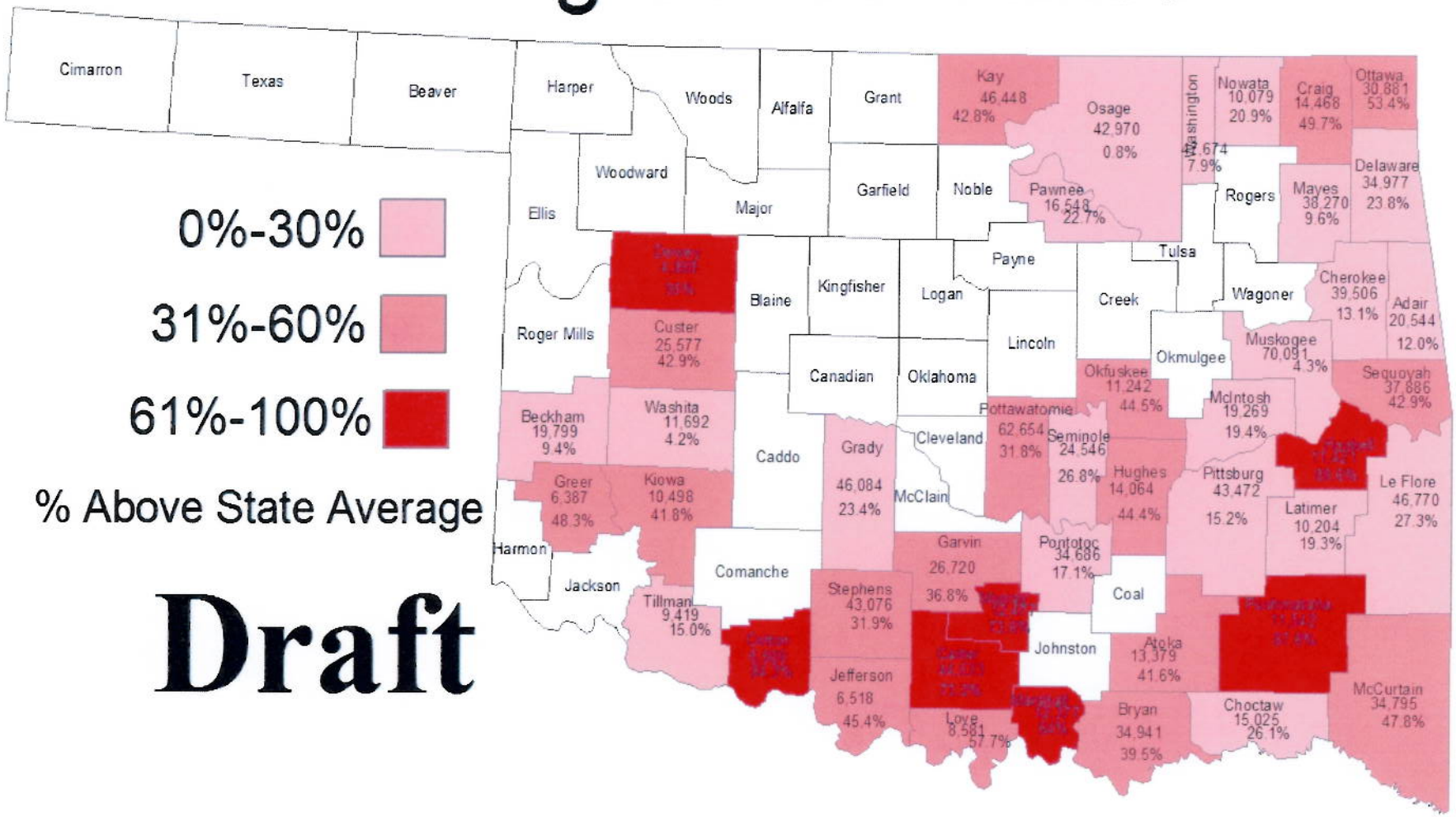
How is Cherokee Nation monitoring HAPs in ambient air?

- CNEP monitoring projects at Cherokee Heights tribal community southeast of Pryor
  - Screening project in winter of 2005
  - Current VOC monitoring project, 2006-2008
  - Future project to monitor metals and VOCs

Why is CNEP monitoring for HAPs at Cherokee Heights?

- Cherokee Heights is adjacent to Mid-America Industrial Park, other industry, and U.S. Highway 412
- Respiratory cancer rates in Mayes County are significantly higher than U. S. average
- Significant industrial emissions of air pollutants in NE Oklahoma

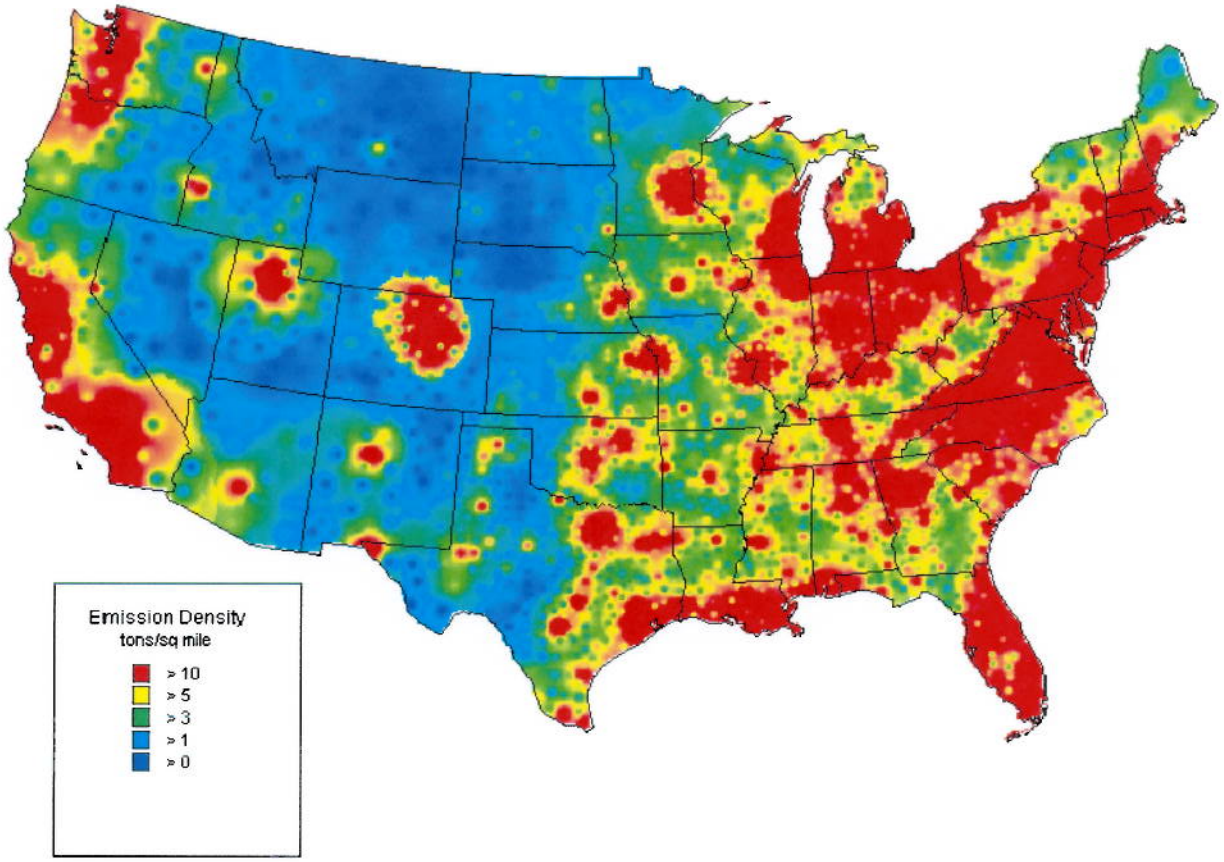
Lung Cancer Rates

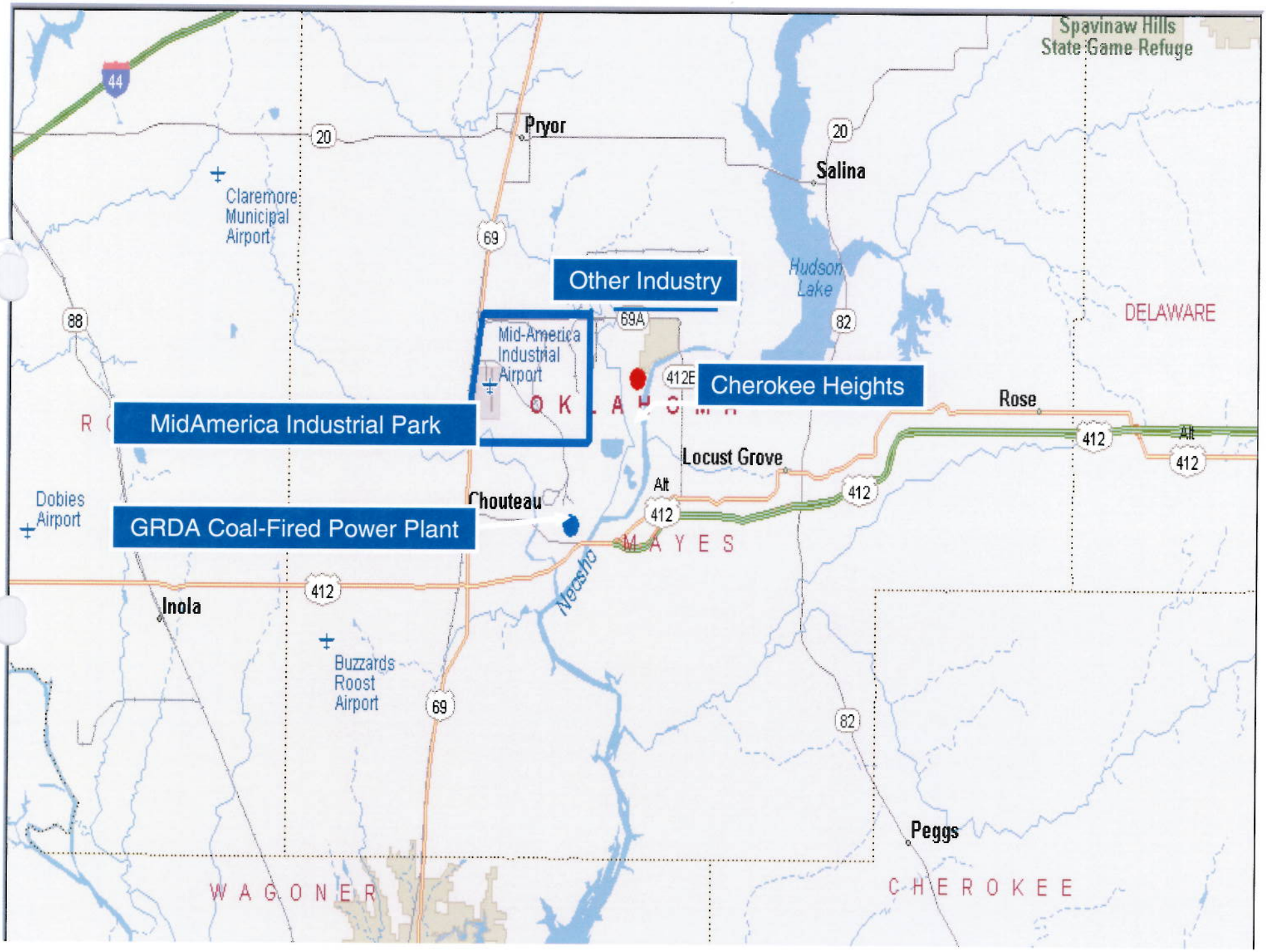


Draft

Data Source: American Lung Association

Figure 2-11. Density Map of 1998 VOLATILE ORGANIC COMPOUND Emissions by County




Other Industry
MidAmerica Industrial Park
Cherokee Heights
GRDA Coal-Fired Power Plant
Spavinaw Hills
State Game Refuge
Pryor
Salina
Claremore
Municipal
Airport
Hudson
Lake
DELAWARE
Mid-America
Industrial
Airport
Rose
Locust Grove
Chouteau
Dobies
Airport
Inola
Buzzards
Roost
Airport
Neosho
MAYES
WAGONER
CHEROKEE
Peggs
44
20
69
88
69A
412E
412
Alt
82

Coal-Fired Power Plant & MidAmerica Industrial Park

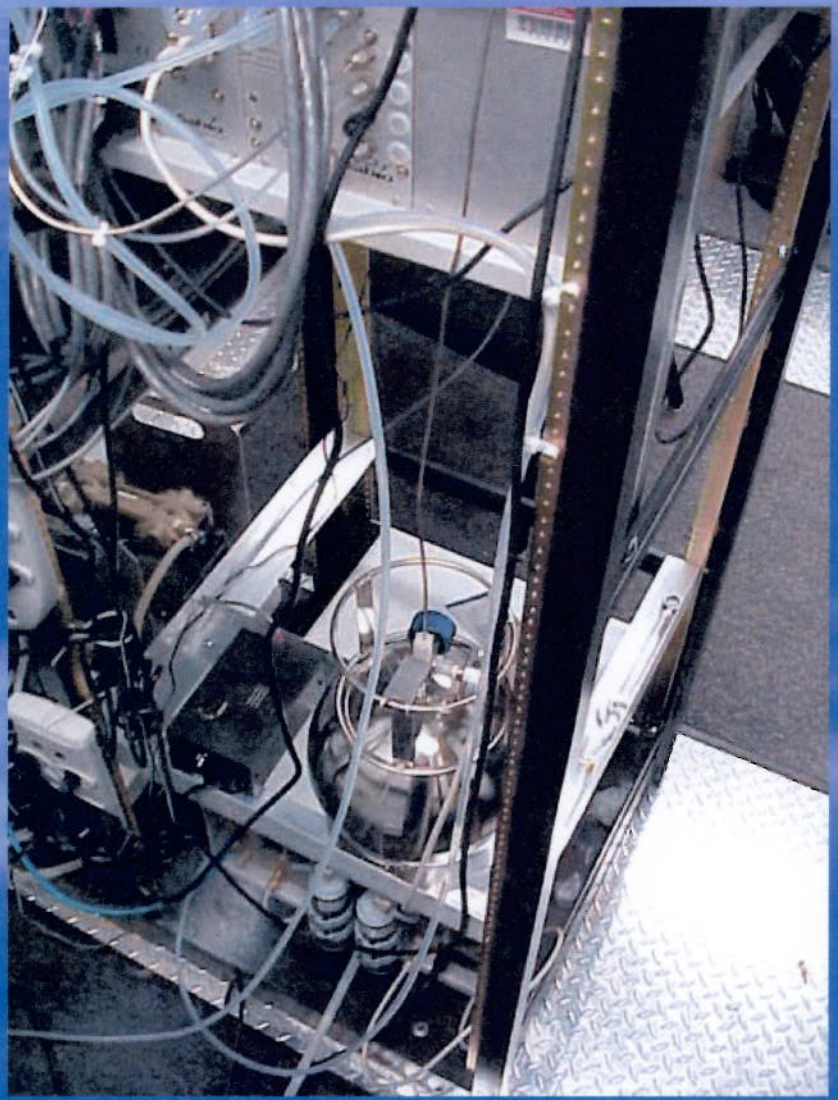
Cherokee Heights Tribal Housing Near Pryor, Oklahoma

113 Homes with approximately 275 residents (approximately 175 are children)

Current CNEP Monitoring Project

- Collect 24-hour sample of ambient air in vacuum canister every sixth day for 18 months (September, 2006 through March, 2008)
- Each sample is analyzed for a suite of 60 VOCs by a laboratory using EPA-approved methods

Sampling Apparatus



Data Analysis for Current Project

- Lab reports sample data to CNEP and posts data on EPA's AQS website
  - www.epa.gov/air/data
  - www.airnow.gov

CNEP Compares Concentrations of Detected VOCs to the Following Benchmarks

- EPA Region 6 Human Health Medium Specific Screening Levels
  - Chronic inhalation toxicity values (non-cancer and cancer values)
  - Region 6 screening values for ambient air
- ODEQ Maximum Acceptable Ambient Concentrations (MAACs)
- ATSDR Minimal Risk Levels (MRLs) for inhalation

These benchmarks are posted on the following web pages

- www.epa.gov/earth1r6/6pd/rcra_c/pd-n/screen.htm
- www.atsdr.cdc.gov/mrls.html
- www.deq.state.ok.us/AQDnew/toxics/listings/pollutant_query_1.html

Initial Results of Current Project Sampling at Cherokee Heights

- 76 valid samples obtained from September 26, 2006 to December 20, 2007
- 3 to 7 detected VOCs equalled or exceeded EPA, ODEQ, and/or ATSDR benchmarks in one or more samples

Initial Results of Current Project Sampling at Cherokee Heights

VOC	Number of Samples in which Benchmark Exceeded (76 total samples)	Concentration range of VOC in 76 samples (µg/m3)
Acrolein	74	0.18 – 4.3
Chloromethane	44	0.39 – 1.91
1,3-Butadiene	13	0.02 – 0.10
Chloroform	27	0.05 – 0.19

Initial Results of Current Project Sampling at Cherokee Heights

VOC	Number of Samples in which Benchmark Exceeded (76 total samples)	Concentration range of VOC in 76 samples (µg/m3)
Benzene	76	0.17 – 1.09
Carbon Tetrachloride	76	0.21 – 1.01
Trichloroethylene (TCE)	10	0.05 – 0.54
1,2-Dichloroethane	1	0.12

Data Analyses

- Chloromethane, chloroform, trichloroethylene, and 1,2-dichloroethane exceeded only screening levels
- Benzene and carbon tetrachloride exceeded both screening levels and cancer benchmarks
- 1,3-Butadiene exceeded a cancer benchmark

Data Analyses (continued)

- Acrolein exceeded both screening levels and a non-cancer benchmark
- In addition, acrolein was the only VOC to exceed both the ODEQ MAAC and the ATSDR MRL

How Serious Is the Threat Posed by VOCs at Cherokee Heights?

- Data collected in 2006 by Oklahoma Department of Environmental Quality (ODEQ) show that VOC concentrations tend to be higher in the urban/industrial environment of Tulsa than in the more rural environment of Cherokee Heights

How Serious Is the Threat Posed by VOCs at Cherokee Heights?

- ERG's "2006 UATMP Final Report" estimated risks that VOCs pose to human health in Tulsa and at Cherokee Heights
  - Cancer risk at Cherokee Heights might be approximately 3 in-a-million
  - Non-cancer risk at Cherokee Heights may not be significant
  - Cancer and non-cancer risks are estimated to be higher in Tulsa

Conclusion

- Based on 2006 Data, VOCs pose only a slight risk to human health at Cherokee Heights
- VOC data collected for 2007 have yet to be analyzed, but estimated risks (based on 2007 data) are not expected to be significantly greater than the risks estimated from 2006 data

Future Monitoring and Risk Assessment

- CNEP hopes to expand air toxics sampling at its Cherokee Heights site to include metals and continuous VOC monitoring
- Data from current and future air toxics monitoring projects at Cherokee Heights will be used in a human health risk assessment